

(12) **UK Patent Application** (19) **GB** (11) **2 197 842 A** (13)
 (43) Application published 2 Jun 1988

(21) Application No 8726200

(22) Date of filing 9 Nov 1987

(30) Priority data
 (31) 864854 (32) 28 Nov 1986 (33) FI

(71) Applicant
Valmet Paper Machinery Inc
 (Incorporated in Finland)
Punatötkönkatu 2, 00130 Helsinki, Finland

(72) Inventors
Teuvo Lappalainen
Karl Erik Ekblom

(74) Agent and/or Address for Service
Mathisen Macara & Co
The Coach House, 6/8 Swakeleys Road,
Ickenham, Uxbridge UB10 8BZ

(51) INT CL.
B65B 11/04

(52) Domestic classification (Edition J):
B6C U25 W5

(56) Documents cited
GB 1447799 GB 0301643

(58) Field of search
B6C
Selected US specifications from IPC sub-class
B65B

(54) Method and apparatus for wrapping a roll, particularly a paper roll

(57) In a method and apparatus for wrapping a roll, the roll 1 is transported by conveyor means 10, 12 onto rotatably driven support rollers 2. Inner roll heads or covers are attached to the ends of the roll if required, the roll is rotated on the support rollers, wrapping paper is fed from a wrapping paper roll 8 by means of a pulling apparatus 7 via gluing 14 and shearing means 13 into the nips formed by the support rollers and the roll, the wound paper is trimmed and glued into a wrapped band and the excess extending beyond the roll is folded over by a folding apparatus onto the ends of the roll over the inner heads, which are possibly attached to the ends. Outer heads or covers are then attached by a press 19 over the folded over wrapping paper and roll ends, while the roll is still supported by the support rollers.

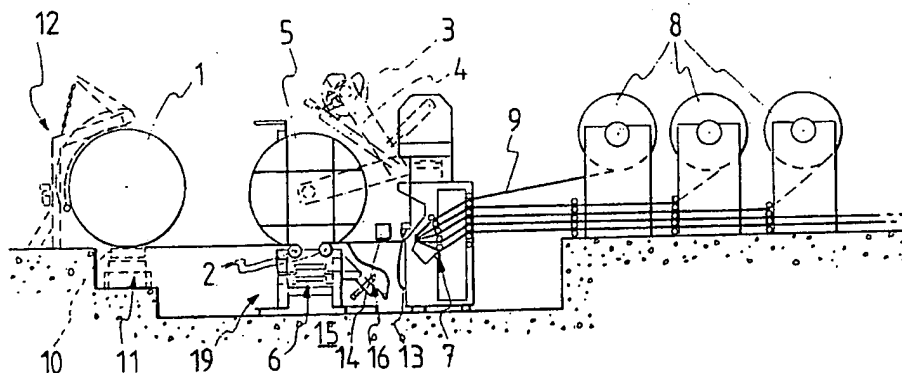


Fig.1

GB 2 197 842 A

1/5

2197842

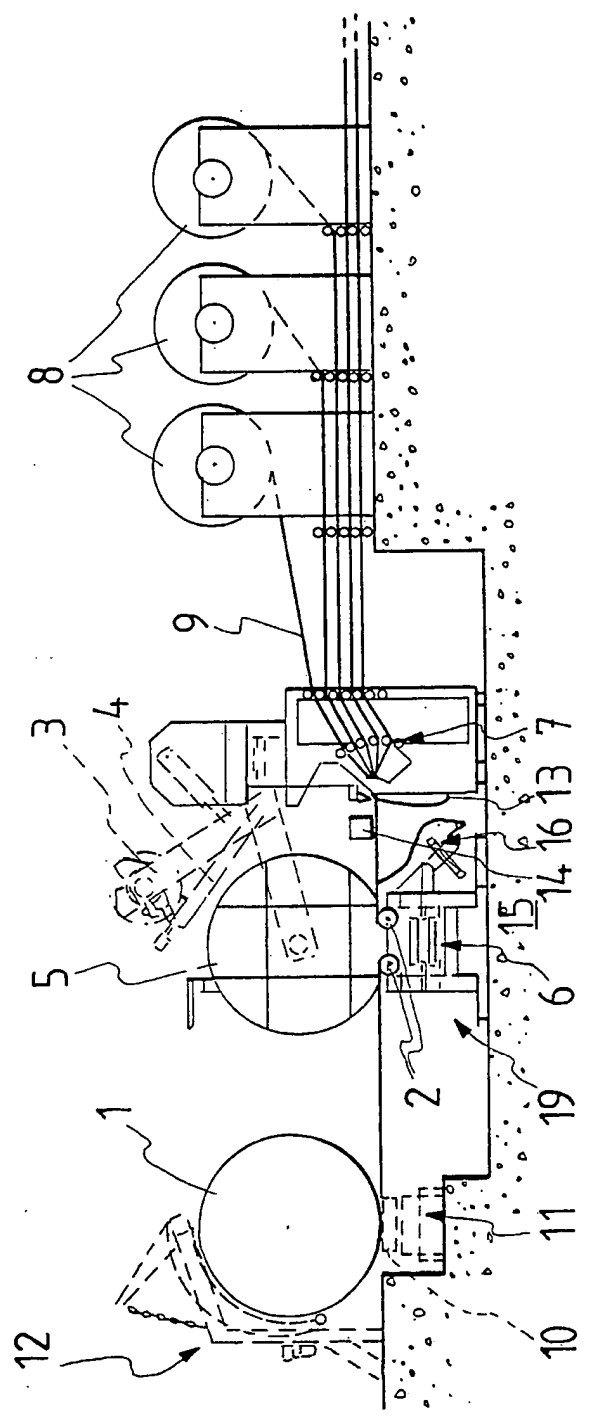
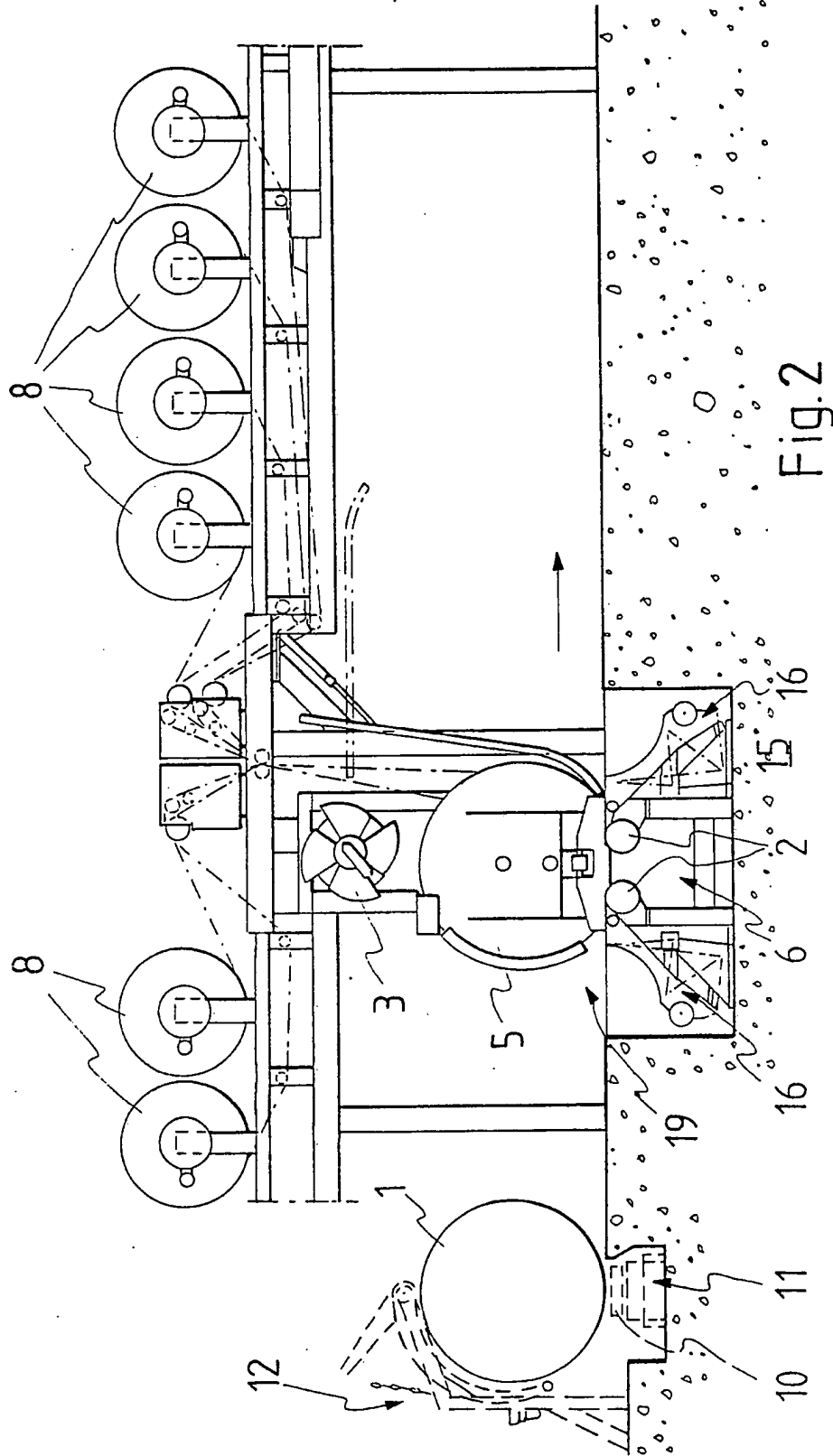


Fig.1



3/5

2197842

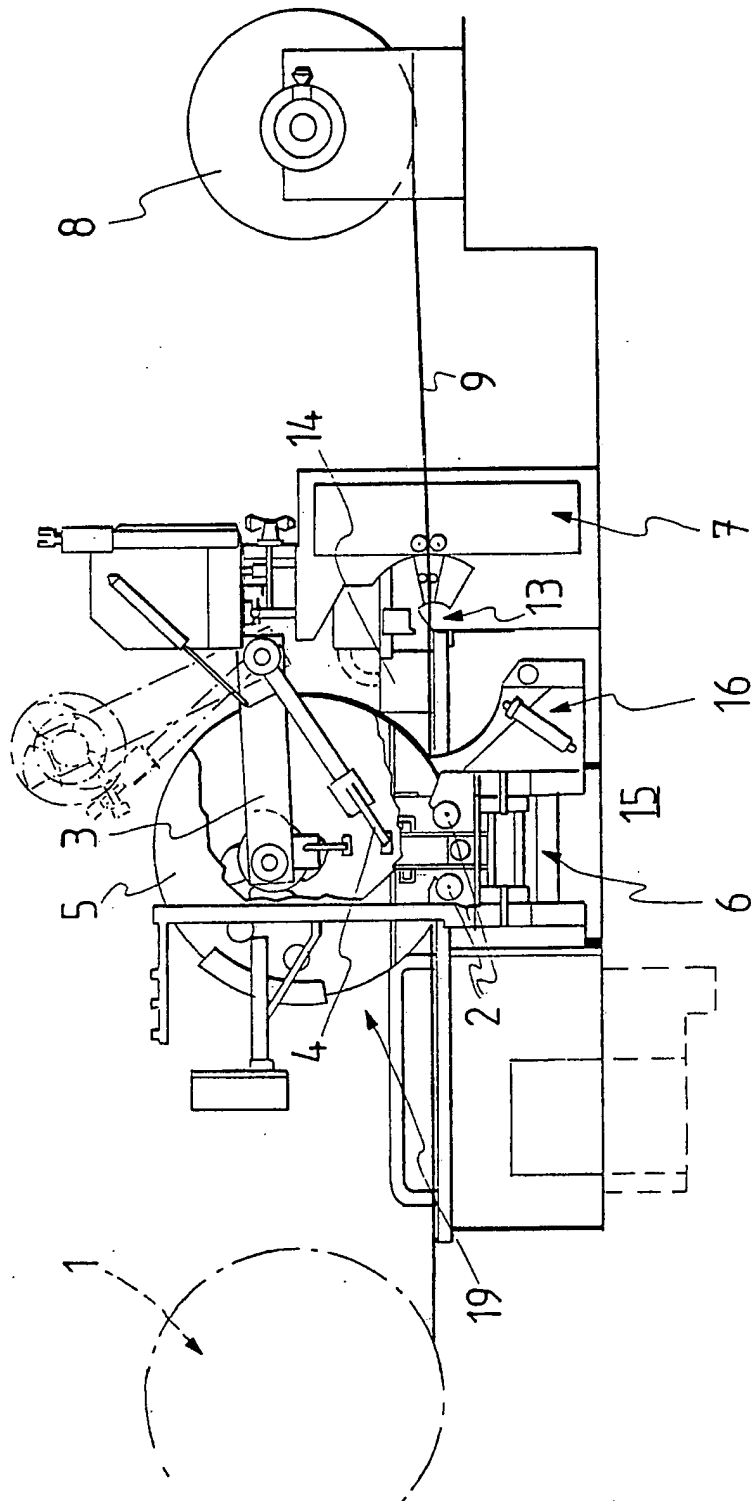


Fig.3

4/5

2197842

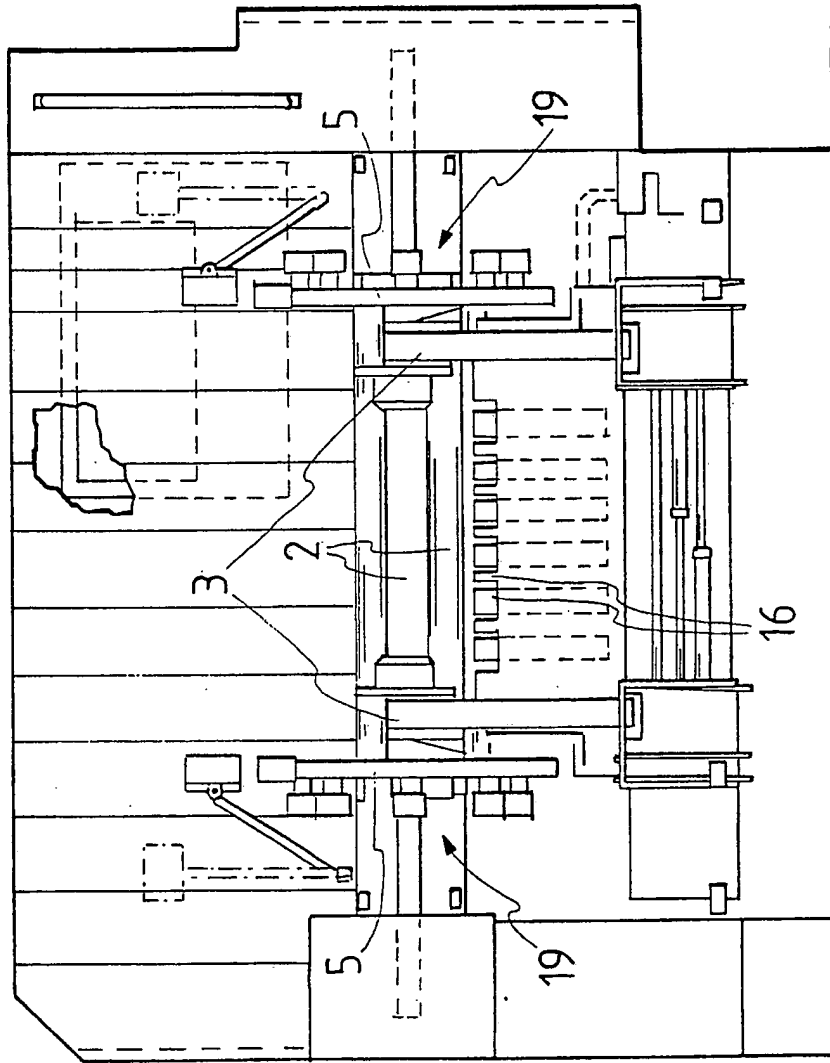


Fig. 4

5/5

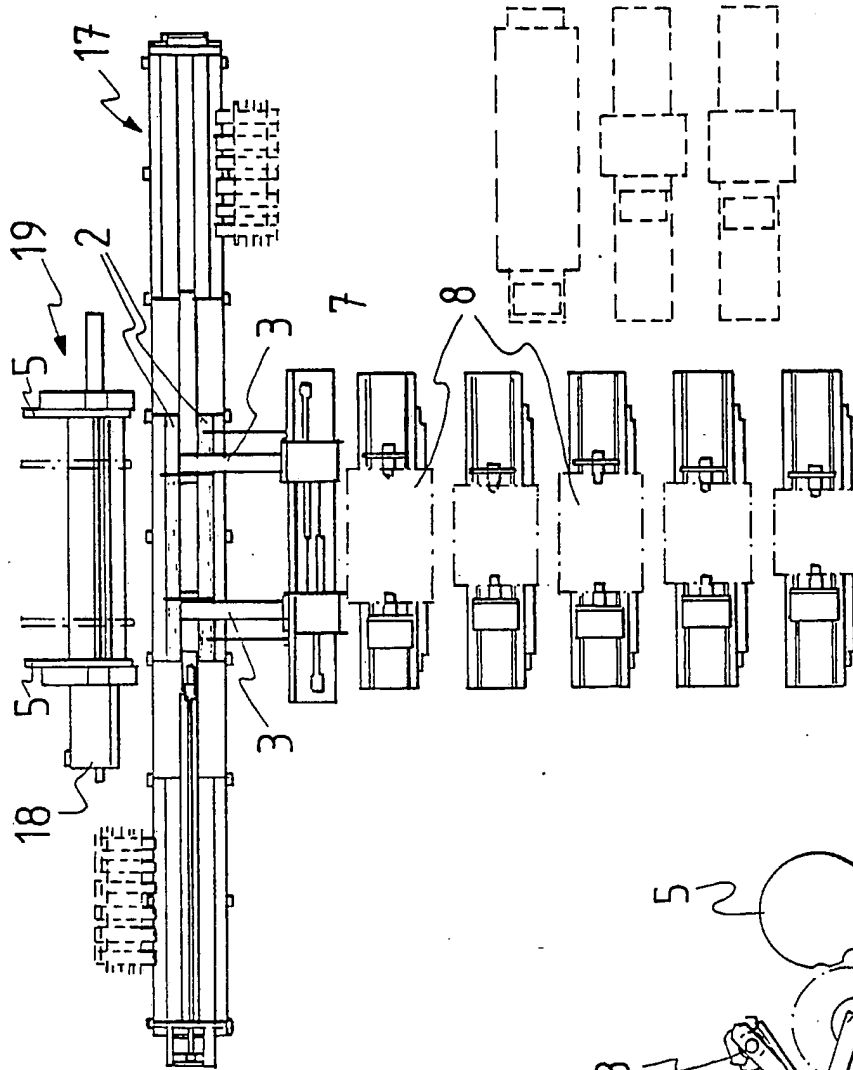


Fig. 6

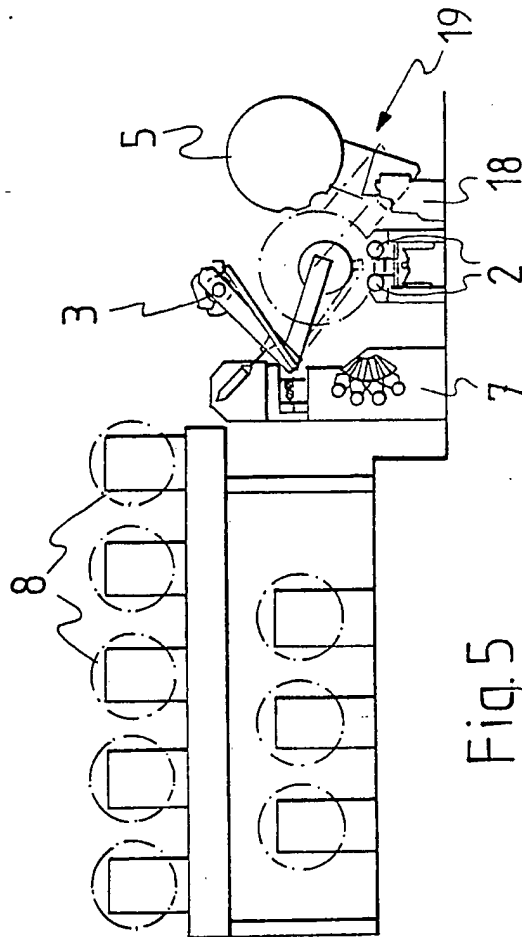


Fig. 5

METHOD AND APPARATUS FOR WRAPPING A ROLL,
PARTICULARLY A PAPER ROLL

The present invention relates to the wrapping of a roll, particularly a paper roll.

In the inventions of the prior art, the paper rolls are wrapped stagewise in several subsequent units under manual or automatic control.

A disadvantage of the conventional technique is that the subsequent units require a large working area and, in manual operation, also require considerable manpower. With help of automation, the manpower requirements can be reduced, but investment costs increase then to an excessively high level in low-capacity production lines, while, however, the wide space requirements cannot be eliminated.

The aim of the present invention is to overcome the disadvantages of the prior art technology and to achieve a totally new kind of method and apparatus for wrapping a roll.

The invention is based on the adaptation of the wrapping press to be located in conjunction with the roll wrapping unit close to the support rollers so that the roll heads can be attached to the ends of the roll with help of the heating platens of the press without moving the roll from the unit.

More specifically, according to one aspect of the invention, there is provided a method of wrapping a roll, particularly a paper roll, in which a roll is transported by transportation means to the wrapping station onto rotatable support rollers to a position

with the axis of the roll aligned approximately parallel with the axes of the support rollers, inner heads are, when required, placed to the ends of the roll, the roll is rotated by means of a drive apparatus of the support rollers, wrapping paper is fed from a wrapping paper roll by means of a pulling apparatus via gluing and shear units into nips formed by the support rollers and the roll, and the wrapping paper is sheared and glued into a band-shaped wrap and the excess wrapping paper extending over the ends of the roll is folded by a folding apparatus over the inner heads possibly placed at the ends of the roll, characterized in that outer heads are attached by a press onto the rims of a wrapping paper band folded over the ends of the wrapped roll while the roll is still supported by the support rollers, i.e. while the roll is still in the same wrapping unit where the roll was wrapped.

According to a further aspect of the invention, there is provided a wrapping unit for wrapping a roll, particularly a paper roll, comprising a chassis mounted on a base, support rollers, arranged on the chassis and provided with a drive apparatus, for supporting and rotating the roll, a feeder means for feeding a wrapping material into a nip formed by the support rollers and the roll, gluing and shearing means for gluing the fed wrapping material and trimming it to the desired length, a folding apparatus for folding the excess wrapping band over the ends of the roll, and a press with heating platens for attaching heads to the roll, characterised in that the press is arranged so as to align the effective areas of the heating platens of the press to coincide in their pressing position approximately with the vertical symmetry plane of the longitudinal axes of the support rollers in order to position the head flaps to the ends of the roll without moving the wrapped roll from the support provided by the support rollers.

The apparatus in accordance with the invention permits a single operator to handle the entire wrapping operation without being compelled to walk between the different packing units. Compared with prior art constructions, the apparatus consumes an appreciably small space permitting its location in existing premises with lower costs of modification. Consequently, the total investment costs less and, compared with prior art constructions, the wrapping costs are lower.

Exemplifying embodiments of the invention will now be described with reference to the attached diagrammatic drawings, in which:-

Figure 1 is a part sectional side view of one example of a wrapping line equipped with a wrapping unit in accordance with the invention;

Figure 2 is a view similar to that of Figure 1 but of another example of wrapping line equipped with a wrapping unit in accordance with the invention;

Figure 3 is a partial, more detailed, side view of a third example of wrapping line equipped with a wrapping unit in accordance with the invention and similar to the example of Figure 1;

Figure 4 shows a partly cut-away top plan view of the wrapping line illustrated in Figure 3;

Figure 5 is a side view showing the arrangement of a fourth example of wrapping line equipped with a wrapping unit in accordance with the invention; and,

Figure 6 shows a top plan view of the wrapping line illustrated in Figure 5.

In Figure 1 a possible embodiment of a wrapping unit in accordance with the invention is illustrated. An unwrapped roll 1 is transported by a conveyor 10 to the center line of the wrapping unit. The roll 1 is weighed in a scale 11 mounted under the conveyor 10. The wrapping unit operator controls a pusher 12, which pushes the weighed roll 1 away from the transport carrier 10 onto support rollers 2 of the wrapping unit to the point, where they are stopped by pusher gages 16 of the wrapping unit. The support rollers 2 are mounted on a support roller chassis 6. The chassis 6 as such is mounted onto a base 15. The operator, seated at the side of the wrapping unit, locates two inner roll heads with the help of head retaining arms 4 onto the ends of the roll 1 so starting the automatic wrapping and folding phases. Next, the support rollers 2 are rotated by means of a drive (not shown), and wrapping paper 9 is pulled from wrapping paper rolls 8 with pulling rolls 7 through a shear 13 and gluing unit 14 into the nips, which are formed by the support rollers 2 and the roll 1, until sheared by the shear 13 when a sufficient length of the wrapping paper 9 has been metered. Glue is applied onto the wrapping paper 9 at an appropriate stage by means of the gluing unit 14, which can be, e.g., a hot-melt gluing unit or a sodium silicate (water glass) gluing unit. The excess wrapping paper extending over the ends of the roll 1 is folded in a conventional manner over the inner heads by a folding apparatus 3. During the wrapping operation, the operator places the heads on heating platens 5 of a press 19. The press 19 is adapted to the same chassis 6 as the support rollers 2 so that the centers of the round heating platens 5 are located approximately in the vertical symmetry plane of the longitudinal axes of the support rollers 2 so avoiding the jerking of the roll 1 when gluing the outer heads to the roll. After completing wrapping and gluing, the operator waits until the roll 1 has stopped rotating before issuing the

press apparatus 19 a pressing command that causes the heating platens 5 to move until abutting the ends of the roll 1 and to glue and/or heat-melt glue the outer heads to the ends. The roll 1 is then ready to be returned by the pusher gages 16 onto the conveyor 10 for transportation onwards while the conveyor 10 introduces a new roll 1 to be pushed to the wrapping unit.

Figure 2 illustrates an embodiment in which the wrapping paper is fed from wrapping paper rolls 8, which are placed on a support, allowing the wrapped roll 1 to be pushed forward from the wrapping unit, or to the left in the figure.

Figure 3 illustrates in greater detail the construction of a wrapping unit. This embodiment is illustrated only for one wrapping paper roll 8; however, several of them can be conceivably used.

Figure 4 illustrates in a top view the placement of the support roller 2 in relation to the folding apparatus 3 and the heating platens 5 of the press 19.

The integration of wrapping operation phases can be extended by adapting a scale 11 between the chassis 6 and the base 15 to avoid the inconvenience of weighing the roll on the carrier 10. The shape of the heating platens 5 may also be conceived as rectangular, polygonic, or oblong. Moreover, any other shape is conceivable as long as the pressure/heat exerting areas of the heating platens 5 coincide with the ends of the roll 1 to fix the head flaps in correct position.

As illustrated in Figs. 5 and 6, the roll may also be ported to the wrapping unit in the direction of the axes of the support rollers 2 by means of a indexing conveyor 17, which requires the use of a sideways pivotal construction for the heating platens 5 of the press 19, which is mounted on a separate chassis 18.

Typical capacity of the apparatus is 50...75 wrappings per hour and the maximum weight of wrapped rolls is in the order of 6000 kg.

CLAIMS

1. A method of wrapping a roll, particularly a paper roll, in which

- a roll is transported by transportation means to the wrapping station onto rotatable support rollers to a position with the axis of the roll aligned approximately parallel with the axes of the support rollers,
- inner heads are, when required, placed to the ends of the roll,
- the roll is rotated by means of a drive apparatus of the support rollers,
- wrapping paper is fed from a wrapping paper roll by means of a pulling apparatus via gluing and shear units into nips formed by the support rollers and the roll, and
- the wrapping paper is sheared and glued into a band-shaped wrap and the excess wrapping paper extending over the ends of the roll is folded by a folding apparatus over the inner heads possibly placed at the ends of the roll,

characterized in that

- outer heads are attached by a press onto the rims of a wrapping paper band folded over the ends of the wrapped roll while the roll is still supported by the support rollers, i.e. while the roll is still in the same wrapping unit where the roll was wrapped.

2. A wrapping unit for wrapping a roll, particularly a paper roll, comprising

- a chassis mounted on a base,
- support rollers, arranged on the chassis and provided with a drive apparatus, for supporting and rotating the roll,

- a feeder means for feeding a wrapping material into a nip formed by the support rollers and the roll,
- gluing and shearing means for gluing the fed wrapping material and trimming it to the desired length,
- a folding apparatus for folding the excess wrapping band over the ends of the roll, and
- a press with heating platens for attaching heads to the roll,

characterized in that

- the press is arranged so as to align the effective areas of the heating platens of the press to coincide in their pressing position approximately with the vertical symmetry plane of the longitudinal axes of the support rollers in order to position the head flaps to the ends of the roll without moving the wrapped roll from the support provided by the support rollers.

3. A wrapping unit according to claim 2, in which the press is mounted on the chassis.

4. A wrapping unit according to claim 2 or claim 3, in which the heating platens are arranged to pivot sideways to permit the roll to be wrapped to enter and exit the wrapping unit parallel with the axes of the support rollers.

5. A wrapping unit according to any one of claims 2 to 4, in which a scale is arranged between the base and the chassis to provide means for weighing the roll to be wrapped.

6. A wrapping unit according to claim 2, substantially as described with reference to Figure 1, Figure 2, Figures 3 and 4, or Figures 5 and 6 of the accompanying drawings.

7. A method according to claim 1, substantially as described with reference to Figure 1, Figure 2, Figures 3 and 4, or Figures 5 and 6 of the accompanying drawings.